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do not maintain a spiral arrangement similar to the aborted flowers, but an examination of the plant would readily show that displacement is unavoidable. Of the flowers, one of those at the side blossoms first, then the one on the opposite side, and lastly the one in the middle. The arrangement of the various flowers has not been sufficiently studied to *settle* the phyllotactic arrangement of those on the axis of the raceme. How necessary bees are to insure fertilization may be seen from the fact that those clusters which escape the attention of bees by being too much hidden by the surrounding foliage, never spring the keel, so that the flowers wither and die without the keel being loosened. (Gray, Struct. Bot. p. 218). Flowers thus unsprung seem to last longer.*

Fig 10

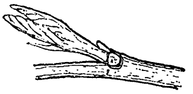

Fig 8

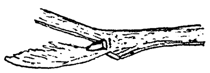

Fig. 9

In connection with this it may be interesting to note that in *Tilia Americana* (Fig. 5) *Catalpa speciosa* (Fig. 6) and *Ailanthus glandulosus* (Fig. 7) the terminal part of the leaf branches falls off, leaving a clean scar (*sc*). The branches are continued by buds in the axils of lower leaves. In *Hamamelis Virginica* (Figs. 8, 9 and 10) the leaves fall off in autumn and leave a scar. In the following spring a plane has been formed just beneath the scar of the former year. At this plane the leaf-scar of the former year falls off leaving another scar for the spring time. This singular phenomenon might be called that of a "deciduous leaf-scar." The accompaning drawings will make unnecessary all further description.

DESCRIPTION OF FIGURES.—*Apios tuberosa.* Fig. 1. Entire raceme seen from above. Fig. 2. The same x 5; flowers fallen off, pedicel of middle flower remaining: *a*, truncated axis of the raceme; *b*, bract subtending the middle flower; *c*, bract subtending the raceme; *d*, circular depression left by the pedicel of the flowers. Fig. 3. Truncated axis of raceme x 5, showing attachment of flower-pedicels. Fig. 4. Deciduous end of the panicle. Fig. 5. *Tilia Americana:* scar, *s c*, of leaf-branch. Fig. 6. *Catalpa speciosa:* scar, *s c*, of leaf-branch. Fig. 7. *Ailanthus glandulosus:* scar, *s c*, of leaf-branch. Figs. 8 and 9. *Hamamelis Virginica;* front and side views of leaf-scar before falling off. Fig. 10. Deciduous leaf scar.

New Grasses.

By GEORGE VASEY.

STIPA SCRIBNERI.—Culms 2–3 ft. high, stout, erect; lower leaves half as long as the culm, smooth, flat below, becoming involute at the long acuminate point; upper sheath enclosing the base of the panicle, which is narrow, erect, and 6–8 inches long, the branches in twos or threes and appressed; outer glumes unequal, lower one 6–7 lines, upper about 5 lines long, both 3-nerved, acuminate; flowering-glume 3–5 lines long, hairy, hairs longer above, and at the apex forming a white crown a line or more long; awn rather slender, 8–9 lines long, not hairy; stipe short, very acute, pubescent; palet less than a line long, obtuse and adherent to the grain.

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* Note. The following from Prof. Trelease is of interest: "The sort of glands you find in *Apios* are also found in other Leguminosæ, e.g., species of *Dolichos Phaseolus*, and *Canavalia*. I have noticed them in all but the last named genus; probably they occur in many others.

References: Trelease, in Comstock's Report on Cotton Insects, 1879, 325; *American Bee Joural*, 1880, xvi., 271–2., Figs. 9–10. Delpino, in Atti della R. Universita, Genova, 1880, iv., part i. p. 27."

Differs from *S. viridula* particularly in the unequal glumes, the hairy crowned flowering-glumes, the more slender awn, and the very short palet.

Collected on dry hill-sides at Sante Fe, New Mexico.

FESTUCA CONFINIS.—Culms about 3 ft. high, rather rigid, smooth, radical leaves half as long as the culm, those of the culm 2 or 3, the sheath loose and shorter than the internodes, blade flat, 6 inches long, 3 lines wide, ligule short, scarious, obtuse; panicle 4–5 inches long, strict; branches in twos or threes, unequal, erect, the longest twice as long as the internodes, subdivided below the middle, rhachis and branches nearly smooth; spikelet oblong, 3- to 5-flowered, the outer glumes ovate-lanceolate, thin, smooth, 1-nerved, the upper one about 3 lines long, the lower a little shorter; flowering-glumes about 3 lines long, prominently 3-nerved, scabrous, rather rigid, rounded on the back, acutish to very acute, but not awned; palet about equaling its glume, scabrous-ciliate on the keels, adherent to the grain.

This differs from *Poa* chiefly in the rigidity of the culms and the thicker, harsher, more rounded flowering-glumes.

Collected at Peu Gulch, Colorado, altitude 8,000 ft.

ELYMUS SAUNDERSII.—Culms tufted, 2–3 ft. high, slender but firm, smooth; radical leaves involute-setaceous, about half as long as the culm, culm-leaves about 3, the sheaths smooth, the upper one long, the blade rigid, 5–6 inches long, finely scabrous, becoming involute, ligule obsolete; panicle 5–7 inches long, rather cylindrical and flexible, rhachis with 20 or more joints, which are 3 to 4 lines apart; spikelets 2- to 4-flowered, generally in pairs, at least below, frequently singly above and sometimes throughout; upper glumes linear-lanceolate, 3- to 5-nerved below, with 2 short teeth at the apex, scabrous on the midnerve and running into a slender scabrous awn an inch or more in length; flowering-glumes lanceolate, 5-nerved, finely scabrous, 2-toothed at apex, 5 lines long to the awn, which is slender and 1 to 1.5 inch long; palet wide and flat, nearly as long as its glume, bifid, scabrous on the 2 sharply flexed keels. The whole spike generally of a purple color.

One of the handsomest species of the genus. Collected at Veta Pass, Colorado, 9,000 ft. altitude.

On the Existence of a Peculiar Flora on the Kittatinny Mountains of North-western New Jersey.

By N. L. BRITTON.

The occurrence of a group of plants which, from preconceived notions, seem to be out of place in any region, is always of interest to